

*Better
Together*

Patient information

Lumbar Puncture (LP)

Trust Wide: Royal Liverpool Hospital and Broadgreen
Hospital

A lumbar puncture (LP) is a medical procedure where a sample of fluid is taken from inside the lower back for testing. A hollow needle is inserted in a gap between two bones, called vertebrae, at the base of the spine and is used to collect the fluid.

What is cerebrospinal fluid?

Cerebrospinal fluid (CSF) is a colourless fluid, which surrounds and supports the brain and spinal cord. In the same way that studying a blood sample can tell doctors about the health of a person's body, studying a sample of CSF can often reveal a great deal about the health of a person's brain and nervous system. For example, if bacteria are found in a sample of CSF, it's likely to be the result of a brain infection. If a large number of damaged red blood cells are found in a sample of CSF, it may be due to bleeding inside or around the brain. CSF is produced constantly, so the small amount removed during a lumbar puncture is quickly replaced.

How is it performed?

During a lumbar puncture, a hollow needle is inserted in a gap between the two bones at the base of your back and into the space that is below where the spinal cord ends. A small sample of a few (up to 17-18 in adults) millilitres of CSF is removed for testing.

Why is a lumbar puncture done?

The most common reason for a lumbar puncture being carried out is to diagnose encephalitis and meningitis (infection in or around the brain); or bleeding around the brain (subarachnoid haemorrhage). A lumbar puncture can also be used to diagnose other conditions of the brain and spinal cord.

As well as being used to diagnose conditions, a lumbar puncture is sometimes used to give treatments, such as antibiotics.

A lumbar puncture can also be used to remove CSF to relieve pressure placed on the brain by the CSF inside the skull (known as raised intracranial pressure).

What are the benefits of having a lumbar puncture?

The benefits of having a lumbar puncture depend upon the exact situation for which it was performed. A lumbar puncture provides doctors with valuable information to help diagnose a disease of the brain and/or spinal cord and make sure they can start the right treatment. This information could be life- saving and prevent significant disability.

What are the risks of having a lumbar puncture?

❖ Commonly occurring risks (greater than 1 in 10)

Include a headache and a backache around the needle puncture site. Pain around the lumbar puncture site is usually very short lived (lasting between one and three days).

10-30% of people will develop a headache, usually within 24–48 hours of having the procedure. However, very rarely, it can take up to 12 days for the headache to develop.

This headache usually only lasts for one to three days and is usually a dull or throbbing pain that can sometimes spread to their neck and shoulders. The pain is usually worse when standing or sitting up. Lying down often helps relieve the pain. In most cases, the pain is mild and can be treated with simple painkillers, such as Paracetamol, which are available from pharmacies.

Some people have also reported that drinking plenty of water (two to three litres per day) or drinks containing caffeine, such as coffee, tea and / or cola, may help reduce their symptoms.

❖ Occasional risks (between 1 in 10 and 1 in 50)

Include failure of the procedure. The doctor may not be able to accurately find the place where the needle should be inserted. If this happens, the procedure may be stopped. Secondly, when the doctor inserts the needle you may experience a short term (usually lasts no more than 60 seconds) tingling pain in the leg or buttock, similar to knocking your 'funny bone'; this does not cause long term damage to the nerve.

❖ Extremely rare risks (less than 1 in 100000)

Include infection requiring antibiotics. The risk of introducing infection that causes meningitis (infection of the covering layers around the brain) is very low (less than 1 in 200 000) (If you develop a temperature, neck stiffness, a headache that is worse when looking at bright lights, vomiting or confusion after an LP you should attend hospital as an emergency. The risks of this are very small. Your doctor will take special precautions to ensure that your back is clean throughout.

Rarely, bleeding occurs around the lumbar puncture area; this can cause a bruise in the skin, however, the risk of serious bleeding which can extend to push on the spinal cord (and may result in spine damage) is less than 1 in 360 000. Your doctor will check that you and your family do not have any bleeding problems and will not perform the procedure if you are high risk for this.

Lastly, movement of the brain (herniation) is a very rare occurrence, which can happen even without performing a lumbar puncture; this is potentially serious and can result in paralysis and even death. However, there are clear national guidelines which state who is at high risk of this and when the procedure should not be performed.

If your doctor has any concerns that you are at risk for this, they will perform a scan of your brain before the lumbar puncture. If this shows significant compression of the brain a lumbar puncture will not be performed.

Are there any alternative investigations available?

There are no other practical means of obtaining a sample of CSF.

What will happen if I decide not to have the test?

If you decide not to have this test it may delay the diagnosis of your condition, and this may limit your doctor's ability to decide on the correct treatment for you.

The procedure

You may be asked to lie on one side with your legs pulled up and your chin tucked in, so that your spine is curved. This will help open up the spaces between the bones in your spine, allowing the needle to be inserted more easily. Sitting while bending forwards also works well.

An antiseptic solution will be applied to the skin at the base of your spine, which may feel cold. A local anaesthetic will then be used to numb the area of skin around your lower back. It is important to keep still during the procedure.

Your doctor will check that you are not allergic to local anaesthetics. If you are not then a small needle will be used to inject the local anaesthetic under the skin. This can initially feel like a 'tingling', but within one to two minutes your skin should be numb. You should continue to be able to feel the doctor's hands on your back, but you should not feel pain. Because the anaesthetic is only given to the skin it is safer than putting people to sleep.

Local anaesthetic is a medicine that makes an area numb: it may be provided by an anaesthetist, surgeon or other healthcare professional, depending on the technique used.

Like all medicines, local anaesthetics may sometimes cause side effects, as well as the effects that are needed. You may experience dizziness, blurred vision, drowsiness and very occasionally loss of consciousness.

Serious side effects are rare, and include fits, low blood pressure, slowed breathing and changes in heartbeat, which may be life-threatening. If you have any concerns about any of these effects, you should discuss them with your doctor.

The doctor will put a hollow needle in between the gap between two bones at the base of the spine and into the space below the end of the spinal cord.

After the needle has been inserted, a small amount of CSF will drip back into a pot underneath the needle. Only a few (up to 17-18) millilitres of CSF are usually removed. If the doctor needs to measure the pressure of the CSF, they will attach a special tube to the needle to check the pressure of the fluid coming out.

Once the procedure is complete, the needle will be removed and a small plaster will be put on the skin. This can be removed the next day.

The CSF sample will be sent to a laboratory to be tested. The whole lumbar puncture procedure, including getting your position correct and cleaning the skin and letting the local anaesthetic work, usually takes about 30-45 minutes.

Afterwards

After the lumbar puncture, you may be asked to lie flat for approximately an hour. You can sometimes go home the same day if you are well and the results of the CSF are normal. You can take the plaster off after 24 hours.

You will be advised not to drive for the next 24 hours and to drink plenty of fluids over the next few days.

Important information

A small number of people experience more severe pain. If you develop a severe headache you should contact your family doctor (GP) for advice. You may need to be admitted to hospital so that you can be given stronger pain relief.

If it is not possible to speak to your GP, you can call NHS Direct on 0845 46 47 or your local out-of-hours service.

Contact your GP for advice if you have any of these after a lumbar puncture: (Out of hours please attend your nearest Accident and Emergency Department)

- Vomiting or nausea
- Fever (a high temperature; or the 'shakes' of a high temperature)
- Swelling and redness around the injection site
- Clear fluid or blood leaking from the site
- Photophobia (bright lights hurting your eyes)
- Neck stiffness
- Confusion
- New weakness, numbness or tingling of the feet, legs or buttocks
- New difficulty knowing when your bladder or bowels are full or difficulty with controlling when your bladder or bowel open.

Getting your results

It can take anything from a couple of hours to a couple of weeks for your results to arrive, depending on what tests are being done on the CSF. Some tests such as a white blood cell count or checking for red blood cells can be done quite quickly; in the case of a medical emergency, the test results should be available within a couple of hours.

Other tests, such as checking for bacteria, viruses, inflammation markers or cells are more complex and may take 48-72 hours to complete, or sometimes up to a week.

Further Information

Meningitis UK

www.meningitisuk.org

email: information@meningitisUK.org

Telephone: 0117 947 6320

Neurosupport Centre Liverpool

Norton Street L3 8LR

www.neurosupport.org.uk

email: info@neurosupport.org.uk

Telephone: 0151 298 2999

The Encephalitis Society

www.encephalitis.info

Telephone: +44 (0)1653 699599

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